

From glowbugs@theporch.com Mon Apr 8 10:12:43 1996  
Return-Path: glowbugs@theporch.com  
Received: from uro (localhost.theporch.com [127.0.0.1]) by uro.theporch.com  
(8.7.5/AUX-3.1.1) with SMTP id KAA01498; Mon, 8 Apr 1996 10:07:31 -0500 (CDT)  
Date: Mon, 8 Apr 1996 10:07:31 -0500 (CDT)  
Message-Id: <199604081507.KAA01498@uro.theporch.com>  
Errors-To: ws4s@midtenn.net  
Reply-To: glowbugs@theporch.com  
Originator: glowbugs@theporch.com  
Sender: glowbugs@theporch.com  
Precedence: bulk  
From: glowbugs@theporch.com  
To: Multiple recipients of list <glowbugs@theporch.com>  
Subject: GLOWBUGS digest 154  
X-Listprocessor-Version: 6.0c -- ListProcessor by Anastasios Kotsikonas  
X-Comment: Please send list server requests to listproc@theporch.com  
Status: 0

#### GLOWBUGS Digest 154

Topics covered in this issue include:

- 1) mixer stage help needed  
by Bob Roehrig <broehrig@admin.aurora.edu>
- 2) Russian Tubes  
by "James P. Rybak" <jrybak@mesa5.Mesa.Colorado.EDU>
- 3) Re: mixer stage help needed  
by mjsilva@ix.netcom.com (michael silva)
- 4) Re: mixer stage help needed  
by Henry van Cleef <vancleef@bga.com>
- 5) mixer stage help needed - TNX!  
by Bob Roehrig <broehrig@admin.aurora.edu>

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Date: Sun, 7 Apr 1996 18:28:30 -0500 (CDT)  
From: Bob Roehrig <broehrig@admin.aurora.edu>  
To: glowbugs <glowbugs@theporch.com>  
Subject: mixer stage help needed  
Message-ID: <Pine.ULT.3.91.960407182238.17899B-100000@admin.aurora.edu>

I have a problem that maybe you valve guru's can answer.  
I have a 6SN7, 1/2 of which is being used as a mixer.  
Grid is driven with 6Vp-p of 7.5 MHz sine wave.  
Cathode is driven with 5Vp-p of 5.7 MHz sine wave.  
Plate has tank tuned to 1.8 MHz.  
The problem is that I only get 3Vp-p of 1.8 MHz on the plate.

DC parameters are good class A with the plate sitting at about 1/2 the supply voltage so it's not near saturation or cutoff. Is this normal? I always thought that mixers would have some gain.

E-mail broehrig@admin.aurora.edu  
CIS: Data / Telecom

73 de Bob, K9EUI

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Date: Sun, 7 Apr 1996 17:29:48 -0600 (MDT)  
From: "James P. Rybak" <jrybak@mesa5.Mesa.Colorado.EDU>  
To: Glowbugs <glowbugs@theporch.com>  
Subject: Russian Tubes  
Message-ID: <Pine.SV4.3.91.960407172915.7173C-100000@mesa5.mesa.colorado.edu>

I need to get some replacement tubes (811A and some others). Are both Sovtek and Svetlana tubes equally good? Is there any reason to choose one brand over the other?

Thanks.

Jim Rybak W0KSD

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Date: Sun, 7 Apr 1996 21:46:32 -0700  
From: mjsilva@ix.netcom.com (michael silva)  
To: glowbugs@theporch.com  
Subject: Re: mixer stage help needed  
Message-ID: <199604080446.VAA25099@dfw-ix1.ix.netcom.com>

Bob, K9EUI, wrote:

>I have a problem that maybe you valve guru's can answer.  
>I have a 6SN7, 1/2 of which is being used as a mixer.  
>Grid is driven with 6Vp-p of 7.5 MHz sine wave.  
>Cathode is driven with 5Vp-p of 5.7 MHz sine wave.  
>Plate has tank tuned to 1.8 MHz.  
>The problem is that I only get 3Vp-p of 1.8 MHz on the plate.  
>  
>DC parameters are good class A with the plate sitting at about 1/2 the  
  
>supply voltage so it's not near saturation or cutoff. Is this normal?

I

>always thought that mixers would have some gain.

The gain of a mixer is indicated by it's conversion transconductance, and this runs between 400 and 500 umhos for common converter tubes (with optimum LO levels, e.g. 10V rms for external excitation of a 6BE6). I don't know what the figure would be for a 6SN7 at ~7 MHz input, but pulling a number of 100 umhos out of the air will give a conversion gain of 1 with a 10k load (and that figure would probably require a much higher signal level for one of the inputs that the 2V rms or so that you're using). So, without having looked into the actual figures for your tube and conditions I'd say your results aren't too surprising.

73,

Mike, KK6GM

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Date: Mon, 8 Apr 1996 03:03:48 -0500 (CDT)  
From: Henry van Cleef <vancleef@bga.com>  
To: broehrig@admin.aurora.edu  
Cc: glowbugs@theporch.com  
Subject: Re: mixer stage help needed  
Message-ID: <199604080803.DAA16069@zoom.bga.com>

As Bob Roehrig said

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> I have a problem that maybe you valve guru's can answer.

> I have a 6SN7, 1/2 of which is being used as a mixer.

> Grid is driven with 6Vp-p of 7.5 MHz sine wave.

> Cathode is driven with 5Vp-p of 5.7 MHz sine wave.

> Plate has tank tuned to 1.8 MHz.

> The problem is that I only get 3Vp-p of 1.8 MHz on the plate.

>

> DC parameters are good class A with the plate sitting at about 1/2 the

> supply voltage so it's not near saturation or cutoff. Is this normal? I

> always thought that mixers would have some gain.

>

A good mixer is a class C amplifier, not a Class A. You need solid nonlinearity to get good conversion.

The conversion transconductance is generally on the order of a quarter of the normal transconductance. For a 6SN7 (6J5), you are looking at a low plate resistance, so can expect a  $\mu$  of about 5 at maximum.

You haven't specified plate voltage (Ebb to your tuned plate circuit) or the effective impedance of the plate circuit, so the "3V p-p" is sort of a dimensionless quantity. You are using a triode with low  $R_p$  and low  $\mu$ , so running it into a high impedance is sort of self-defeating.

For Ebb=100 volts, you'll need at least 15 to 20 volts on one element, to see any conversion efficiency. Look at the data for 6SA7 and 6BE6 separately excited. Also, consider using a cascode setup if you are driving a typical 1800 Khz tuned circuit, to get the effective  $R_p$  up higher.

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Hank van Cleef vancleef@bga.com vancleef@tmn.com  
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Date: Mon, 8 Apr 1996 08:40:18 -0500 (CDT)  
From: Bob Roehrig <broehrig@admin.aurora.edu>  
To: glowbugs <glowbugs@theporch.com>  
Subject: mixer stage help needed - TNX!  
Message-ID: <Pine.ULT.3.91.960408083551.5914B-100000@admin.aurora.edu>

What a bunch of responses! - TNX all (Rhett, Hank, Mike, Tom, Bill, Jim).

I'll play around with it more this week and see if I can get more goo out of it. A 6SN7 would not normally be my choice for a mixer but the other half is one of the oscillators and I didn't really want to rewire everything. I'll keep you posted.

E-mail broehrig@admin.aurora.edu  
CIS: Data / Telecom

73 de Bob, K9EUI

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End of GLOWBUGS Digest 154  
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